

Appln. No. 10/727,270
Docket No. 14XZ126392/GEM-0109

REMARKS / ARGUMENTS

Status of Claims

Claims 1-29 are pending in the application. Claims 1-2, 24 and 26-29 stand rejected. Claims 3-23 and 25 are objected to as being dependent upon a rejected claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant appreciates the Examiner's notation of the allowable claims. Applicant has amended Claims 1, 3, 6, 14-18, 25, 26, and 29, and cancelled Claims 2, 27, and 28, leaving Claims 1, 3-26, and 29 for consideration upon entry of the present Amendment.

Applicant respectfully submits that the rejections under 35 U.S.C. §101 and 35 U.S.C. §102(e) have been traversed, that no new matter has been entered, and that the application is in condition for allowance.

Claim Objections

The Examiner advises that should Claim 27 be found allowable, Claims 28 and 29 would be objected to under 37 CFR 1.75 as being substantial duplicates thereof.

Applicant has cancelled Claims 27 and 28.

Accordingly, Applicant respectfully requests the Examiner to reconsider and withdraw these objections, which Applicant considers to be overcome.

Rejections Under 35 U.S.C. §101

Claims 27 and 28 stand rejected under 35 U.S.C. §101, as being directed to non-statutory subject matter.

Applicant has cancelled Claims 27 and 28 without prejudice.

Accordingly, Applicant respectfully requests the Examiner to reconsider and withdraw these rejections, which Applicant considers to be moot.

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Rejections Under 35 U.S.C. §102(e)

Claims 1-2, 24 and 26-29 stand rejected under 35 U.S.C. §102(e) as being anticipated by Argiro et al. (U.S. Patent No. 7,031,504, hereinafter Argiro).

Applicant traverses this rejection for the following reasons.

Applicant respectfully submits that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, *in a single prior art reference.*" *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). Moreover, "[t]he identical invention must be shown in as complete detail as is contained in the *** claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Furthermore, the single source must disclose all of the claimed elements "arranged as in the claim." *Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984). Missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 780, 227 U.S.P.Q. 773, 777 (Fed. Cir. 1985).

Dependent claims inherit all of the limitations of the respective parent claim.

Regarding Independent Claim 1

The Examiner remarks "The examiner would like to suggest that the applicant could overcome Argiro by combining claims 1 and 2 and correcting the ambiguity in claim 2.c." [Paper 20070126, page 6] Applicant appreciates the Examiner's suggestion.

Applicant has cancelled Claim 2 and amended Claim 1 to now include the limitations of Claim 2. Furthermore, Applicant has amended limitations of Claim 2, now incorporated within Claim 1, to recite

"...for each image I_n , calculation of the series of images of a set of attenuation coefficients of points on the image representing vessels in the region of the heart, the set of attenuation coefficients along lines perpendicular to the cranio-caudal axis of the heart..." to correct the ambiguity in Claim 2.c. No new matter has been added by this

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amendment as antecedent support may be found in the specification as originally filed, such as originally filed Claim 2 and Paragraph [0027] for example.

In alleging anticipation of Claim 2, specifically with reference to step c, the Examiner remarks “...*(Step c is ambiguous with respect to the phrase ‘along lines perpendicular to the cranio-caudal axis of the heart’. It is the examiner’s belief that the applicant intended to have this phrase modify ‘attenuation coefficients’; however, current[ly] it appears to be either modifying ‘the image’ or ‘vessels’. Further dependent claims (for example claim 3) clarify the confusion. Until claim 2 is clarified, the examiner will have to interrupt [interpret] it as meaning any of the three. Therefore, an attenuation coefficient can be interrupted [interpreted] as the gray scale values captured by the imaging device. Argiro teaches of (col. 6, lines 51-63; col. 13, lines 1-7) detecting blood vessels, in the preferred embodiment the aorta, to determine the cardiac cycle. The images of the heart would be along perpendicular lines to the cranio-caudal axis.*” (emphasis added) [paper 20070126, page 4]

Applicant has amended step c of Claim 2 (now incorporated in to Claim 1), such that the phrase “...*along lines perpendicular to the cranio-caudal axis of the heart...*” modifies “...*the set of attenuation coefficients...*”, thereby removing the ambiguity and clarifying the phrase.

Accordingly, Applicant respectfully submits that Argiro is absent disclosure of the the now claimed “...*for each image I_n , calculation of the series of images of a set of attenuation coefficients of points on the image representing vessels in the region of the heart, the set of attenuation coefficients along lines perpendicular to the cranio-caudal axis of the heart...*”

Applicant has amended step d of Claim 2 (now incorporated within Claim 1) to now recite “...*calculation of the integral displacement $k_{n,n+1}$...*” to correct a typographical error. No new matter has been added by these amendments as antecedent support may be found in the specification as originally filed, such as Paragraphs [0014] and [0037] for example. A corresponding correction has been made to the specification.

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In alleging anticipation of steps d and e of Claim 2, the Examiner uses the Claim language and provides direction to column 10, line 50 to column 12, line 32 and figure 4 of Argiro for the alleged disclosure.

Applicant finds Argiro to disclose "... *In alternative embodiments, signal filtering is performed by applying an alternative HPF to the aorta signal, again, in order to remove DC component and low frequencies that may correspond to change of aorta size in space rather than in time...* The method of determining the cardiac cycle illustrated in FIG. 4 is desirable, for several reasons. First, it is easy to measure accurately because a reliable segmentation algorithm exists. Second, measuring the cross section of the aorta is insensitive to the shifting and twisting that occurs as the heart beats. Finally, measuring the cross section of the aorta is independent of heart geometry changes in space domain (changes from one acquired image to another)... In alternative embodiments of the invention the motion of a blood vessel wall is determined and used to derive a signal...In an alternative embodiment of the invention, the cardiac signal can be derived using a "Mean Pixel Difference" (MPD) between the acquired images...in MPD each pixel on a first axial image is subtracted from the corresponding pixel on the subsequent adjacent axial image. The absolute value of the pixel differences for the image are summed and divided by the number of pixels in the image..." (emphasis added) [Argiro, col. 11, lines 9-12; col. 12, lines 57-65; col. 13, lines 5-7; col.13, lines 18-25]

Applicant respectfully submits that Argiro initially teaches away from *calculation of displacement (changes) between two acquired images*, but proceeds to disclose *an average of a difference between pixels of successive images*, and is absent disclosure of the claimed "...*calculation of the integral displacement $k_{n,n+1}$ between two successive images I_n and I_{n+1} of the series of images starting from the set of attenuation coefficients calculated for each of the two successive images; and determination of the cardiac cycle starting from all previously calculated integral displacements...*"

Accordingly, Applicant submits that Argiro does not disclose each and every element of the claimed invention arranged as in the claim, and absent anticipatory

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disclosure in Argiro of each and every element of the claimed invention arranged as in the claim, Argiro cannot be anticipatory.

Regarding Independent Claim 26

Applicant has amended Claim 26 to now recite, inter alia: "...a source of radiation; an image recorder facing the source; and a support placed between the source and the image recorder on which there is a patient for whom a region of a heart is to be imaged, wherein the radiography apparatus comprises means for implementing the process of claim 1...".

No new matter has been added as antecedent support may be found in the application as originally filed, such as at paragraph [0023] and Figures 1 and 2, for example.

The Examiner alleges anticipation of each and every element of Claim 26, including "*wherein the radiography apparatus comprises means for implementing the process of claim 1*".

Applicant respectfully submits that for at least the same reasons set forth above regarding the allowability of independent Claim 1, Argiro does not disclose each and every element of the claimed invention arranged as in the claim, and absent anticipatory disclosure in Argiro of each and every element of the claimed invention arranged as in the claim, Argiro cannot be anticipatory.

Regarding Independent Claim 29

Applicant has amended Claim 29 to now include limitations from Claim 2.

Accordingly, Applicant respectfully submits that for at least the same reasons set forth above regarding the allowability of independent Claim 1 (also incorporating the elements of Claim 2), Argiro does not disclose each and every element of the claimed invention arranged as in the claim, and absent anticipatory disclosure in Argiro of each and every element of the claimed invention arranged as in the claim, Argiro cannot be anticipatory.

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In view of the amendment and foregoing remarks, Applicant submits that Argiro does not disclose each and every element of the claimed invention arranged as claimed and therefore cannot be anticipatory. Accordingly, Applicant respectfully submits that the Examiner's rejection under 35 U.S.C. §102(e) has been traversed, and requests that the Examiner reconsider and withdraw of this rejection.

In light of the forgoing, Applicant respectfully submits that the Examiner's rejections under 35 U.S.C. §101 and 35 U.S.C. §102(e) have been traversed, and respectfully requests that the Examiner reconsider and withdraw these rejections.

If a communication with Applicant's Attorneys would assist in advancing this case to allowance, the Examiner is cordially invited to contact the undersigned so that any such issues may be promptly resolved.

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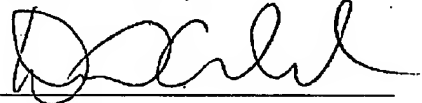
The Commissioner is hereby authorized to charge any additional fees that may be required for this amendment, or credit any overpayment, to Deposit Account No. 50-2513.

In the event that an extension of time is required, or may be required in addition to that requested in a petition for extension of time, the Commissioner is requested to grant a petition for that extension of time that is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to the above-identified Deposit Account.

Respectfully submitted,

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